UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,131	10/28/2003	Kang-Bok Lee	3364P100	5527

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EXAMINER
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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/696,131	LEE ET AL.
	Examiner	Art Unit	
	Sori A. Aga	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 October 2003*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/18/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some *   c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/31/2005 and 10/28/2003*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   Claim1, 2,7,10 rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's

admitted prior art (herein after "Admission") in view of Kao et al (US 7,212,490) (herein after

"Kao") and Cisco Port adaptor (herein after "Cisco").

> Regarding Claim 1, where a ring selection method for node-to-node packet transmission
>
> in a dual ring network including a plurality of transmission nodes and reception nodes,
>
> Admission teaches that FIG. 4 is a flow chart of a ring selection method for dual ring
>
> networks according to prior art.
>
> Regarding 1(a) where the method includes transmitting a reception node address request
>
> message for packet transmission to all the nodes, and updating a routing table using
>
> information on a short path transferred from the reception node; Admission teaches that
>
> the transmission node (420) broadcasts (to all nodes) an ARP Request (reception node
>
> address request message) (step S401-figure 4). Admission also shows the routing table is
>
> updated with information regarding the shortest path. (figure 4).
>
> Regarding 1(b), where the method includes using information on inter-node hop numbers
>
> included in the routing table to select a ring having the lowest hop number between the
>
> reception nodes; Admission teaches "…the reception node selects a ring having the least
>
> hop number with reference to the topology map according to the ARP request
>
> message…" Admission also teaches a routing table (fig.7a) from which information is
>
> used in the route selection.

Regarding 1(c) and (d) where the method includes determining whether or not the ring is

wrapped, Cisco teaches the step of determining how to discover whether a node is

wrapped or not (page 8-10 –highlighted). It would have been obvious at the time of the

invention to determine whether the ring is wrapped or not for fault recovery purposes.

Admission does not explicitly teach the steps of comparing the ring's usage rate and hop

number with reference values based on a ring selection algorithm, and if the selected ring

is suitable for packet transmission based on the reference values, selecting the ring for

packet transmission; However, Kao, in the same field of endeavor as Admission (dual

ring topology networks) teaches "… A check is then made to determine if the congestion

on the ring associated with the shortest path (path with fewest hop number) is greater

than the congestion on the other ring. In one implementation, the congestion check is

made by comparing a latency metric (reference value based on a ring selection algorithm)

for a given node for each ring…" (column 9 lines 46-52). Therefore Kao teaches

comparing the path with fewest hop numbers with reference values based on a ring

selection algorithm (Latency metric). It would have been obvious to enable admission to

include the step of comparing latency metric with the path with fewest numbers. This

step is useful because "…When only path length is considered, added congestion can

arise. For example, the traffic load might not be balanced between the two rings. As such,

a packet added to a ring that is congested may take longer to traverse the shortest path

than if the packet were placed on the other ring (i.e., transit time on the ring with less hop

count may be longer than the transit time on the ring with less traffic)…." (column 2 lines

22-27).

Regarding 1 (d) where if the selected ring is suitable for packet transmission based on the reference values, the ring is selected for packet transmission; Kao teaches selecting the path depending on the comparison on step 358 of fig.3C. Therefore it would have been obvious to select the suitable ring for packet transmission in order to continue in forwarding the data to its destination.

Claims 2 and 10 All the limitations of claim 1 and 8 are included in claims 2 and 10 respectively. Regarding each of the transmission and reception nodes having a topology map including information on inter-node hope numbers, port information, MAC address, and wrapped-or-not information; admission teaches "…The prior art routing table (a) of node 1 presents the inter-node hop number and the hop number-based ring number…". However, admission does not explicitly teach that each node has a topology map including MAC address and wrapped-or-not information. However, Kao, in the same field of endeavor as admission (dual ring topology networks) teaches; "…an example of a topology table that includes topology information is given in fig.5. Each entry includes an address 502 (e.g., a MAC address) for a node (e.g., a destination node) discovered in the network…" (column 10 line 22-27). It would have been obvious to make admission's table include information on MAC address information in order to be used in making routing decisions for host packets. Regarding the topology map including wrapped or not information; admission does not explicitly teach that the topology map shows a wrapped or not information. However, Cisco, in the same field of endeavor as admission (ring networks) teaches "…Every node on a DPT ring maintains a topology map of the ring, so that it knows where to route traffic. It updates the topology map by periodically sending a

query, called a topology discovery packet, out onto the ring....when the discovery packet

returns to the originating node, the contents of the packet are used to update the topology

map..." (page 8). Cisco also shows the topology map includes information on wrapped-

or-not status (page 10). Therefore, it would have been obvious to make the topology map

show a wrapped or not information in order to enable nodes to know what data flow paths

are available for transmission.

Claim 7, all the limitations of claim 1 are included in claim 7. Regarding the method of

selecting the other ring when the selected ring is wrapped; examiner takes official notice

that in selecting paths, the faulty line is avoided whenever possible. Therefore, when a

wrapped ring is encountered in a dual ring topology, the only other available choice is

selected.

2.   Claim5,6 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Admission

as applied to claim1 above, in view of Kao et al (US 7,212,490) as applied to claim1 above, and

Cisco as applied to claim1 above and further in view of Doverspike et al (PG PUB

20020097671) (herein after "Doverspike").

Regarding claim 5, all the limitations of claim 3 are included in claim 5. However,

Admission does not explicitly teach that the transmission coefficient is determined with

reference to the hop number between the transmission node and the reception node, the

usage rate of each node. However Kao teaches "...The method can include calculating a

latency metric as the mathematical average of a previously calculated latency metric and

an average transit delay for all nodes between the node and the given destination node.

The average transit delay can be weighted based on the number of hops between the node

and the given destination node. The transit delay data can be a measure of the amount of

traffic in a low priority queue of a given downstream node. ..."(column 3 lines 58-

63)..." Therefore, Kao teaches the transmission coefficient determined with reference to

the number of hops and delay time. It would have been obvious to add transmission

coefficient calculated with reference to the number of hops and delay time. This step is

useful because "...When only path length is considered, added congestion can arise. For

example, the traffic load might not be balanced between the two rings. As such, a packet

added to a ring that is congested may take longer to traverse the shortest path than if the

packet were placed on the other ring (i.e., transit time on the ring with less hop count may

be longer than the transit time on the ring with less traffic)...." (column 2 lines 22-27).

Regarding the transmission coefficient being determined with reference to the usage rate

of each node, admission does not explicitly teach of a coefficient reference that is

determined with reference to the usage rage of each node. However Doverspike teaches

"...Weights (transmission coefficients) are computed for the links using an array

representing a restoration link capacity--which is expressed as a number of channels ..."

(paragraph 6 lines 9-12). Doverspike further explains that the number of channels

represents bandwidth needed for connection (paragraph 0018 – last sentence). This

definition of 'number of channels' is substantially the same as that of given in the present

invention's specification (i.e. maximum Bandwidth available to the corresponding node).

Therefore, Doverspike teaches that the weigh (transmission coefficient is computed based

on usage rate (number of channels available). It would have been obvious to include

usage rate (number of channels available) in Kao's latency metric in order to properly

balance load between the available links.

Regarding claim 6 and 12, where the usage rate and the transmission coefficient are

calculated in a predetermined cycle, and updated in the routing table; Doverspike teaches

"..., pre-computed restoration paths may be stored at the endpoint nodes of the

connection and utilized, upon a network failure, to reroute the service connection..."

(paragraph 0018 lines 14-17). Therefore, it is inherent that in order for the paths to be

pre-computed and stored, the table used for the computation is updated before the

computation is made. Doverspike also teaches that the pre-computation can be made

during the setup of the connection. Therefore it would have been obvious to calculate the

usage rate and transmission coefficient in a predetermined cycle. A predetermined path

increases performance with respect to data transmission rate since the computation won't

have to be made while a data that is ready for transmission is put on hold until the

computation is made. The decision on the path is already made and therefore the system

is ready and standing by to forward data packets.

3.   Claims 3,8,9,11 rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al (US

7,212,490) (herein after Kao) in view of (Doverspike et al) (PG PUB 20020097671) (herein

after "Doverspike")

Regarding claim 8, where a method for selecting a rig for transmitting packets in a dual

ring network if neither ring is wrapped; Kao teaches "...A method and apparatus for

servicing transmit traffic in a node of a network where the network includes a plurality of

nodes connected by first and second rings formed by two or more transmission media..."

(abstract lines 1-4)

Regarding step (a) where a transmission coefficient for each ring based on for each node

in each ring, a hop number, a usage rate and a delay time is calculated, Kao teaches

calculating a latency metric (transmission coefficient) based on delay time and number of

hops. Kao teaches "...The method can include calculating a latency metric as the

mathematical average of a previously calculated latency metric and an average transit

delay for all nodes between the node and the given destination node. The average transit

delay can be weighted based on the number of hops between the node and the given

destination node. The transit delay data can be a measure of the amount of traffic in a low

priority queue of a given downstream node. ..." (column 3 lines 58-63). Regarding usage

rate being used in calculating the transmission coefficient, Kao does not explicitly teach

that the transmission coefficient is calculated based on usage rate. However, Doverspike

teaches "...Weights (transmission coefficients) are computed for the links using an array

representing a restoration link capacity--which is expressed as a number of channels ..."

(paragraph 6 lines 9-12). Doverspike further explains that the number of channels

represents bandwidth needed for connection (paragraph 0018 – last sentence). This

definition of 'number of channels' is substantially the same as that of given in the present

invention's specification (i.e. maximum Bandwidth available to the corresponding node).

Therefore, Doverspike teaches that the weigh (transmission coefficient is computed based

on usage rate (number of channels available). It would have been obvious to include

usage rate (number of channels available) in Kao's latency metric in order to properly balance load between the available links.

Regarding step (b) where the ring with the lowest calculated transmission coefficient for transmitting packets is selected; Kao does not explicitly teach that the ring with lowest calculated transmission coefficient for transmitting packets is selected. However, Doverspike teaches "... a path with smaller total weight (transmission coefficient) is typically preferable..." (paragraph 0031 lines 3-4). Therefore, it would have been obvious to select the path (ring) with the smaller transmission coefficient (weight) in order to minimize the "cost" to the network.

<u>Regarding claim 3</u>, said references teach the method of calculating a transmission coefficient using the hop number and delay time based on a path between the reception nodes, and inter-node usage rate as discussed regarding claim 8.

Regarding storing the calculated transmission coefficient in the routing table Kao teaches "...in one implementation, the information gathered is stored in a topology table and used in making routing decisions ..." (column 10 lines 21-23). Therefore it would have been obvious to add the transmission coefficient in the table since it is used in making routing decisions.

Regarding the method of selecting a ring having lower transmission coefficient stored in the routing tale as the reference value, said references teach selecting the path (ring) with the fewest transmission coefficient value, as discussed regarding claim 8. Motivation to combine provided in said discussion.

Claim 9, all the limitations of claim 8 are included in claim 9. Regarding the hop number and usage rate being determined with reference to values in a routing table; Kao teaches "...in one implementation, the information gathered is stored in a topology table and used in making routing decisions ..." (column 10 lines 21-23). He also teaches that hop number is included in the topology table (routing table) of fig. 5 (fig 5). Therefore, Kao anticipates that hop number is determined with reference to the value entered in the table. However, Kao does not explicitly teach usage rate. However, Doverspike teaches usage rates as variables for the determination of transmission coefficient. Since Kao teaches information gathered is included in the table to be used in making routing decisions, it would have been obvious for a person who is skilled in the art to include the usage rate data in the table in order to keep an organized and updated data that is gathered from the topology discovery packets.

Claim 11, Regarding calculating a transmission coefficient for each of the nodes, Kao teaches "...process 300 is implemented in each node of network 201..." (column 9 lines 29-31). And process 300 (as shown in figure 3a) includes calculating transit delay vectors (part of the latency metric i.e. transmission coefficient).

Regarding the step of storing the calculated transmission coefficient in a routing table, Kao teaches that information gathered is included in the table to be used in making routing decisions as discussed above regarding claim 9.

Regarding the step of selecting a ring having a lowest transmission coefficient stored in the routing table. Kao does not explicitly teach selecting a ring having a lowest transmission coefficient stored in the routing table. However Doverspike teaches

selecting path (ring) with the lowest transmission coefficient as discussed above

regarding claim 8 step (b). Therefore it would have been obvious for a person who is

skilled in the art to select the path with the lowest transmission coefficient for the same

reason as discussed in said discussion.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

5.   Claim4 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to

particularly point out and distinctly claim the subject matter which applicant regards as the

invention.

All the limitations of claim 1 are included in claim 4. Claim 4 further comprises the

method of "Determining whether or not the selected ring and the ring selected by the ring

selection algorithm are matched to the reference values". Examiner is unable to either

find explanation to further clarify the limitation "matched to the reference value" in the

specification or reasonably construe said disclosure as one of ordinary skill in the art

would.

Examiner is unable to examine the claim further on the merits.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Sori A. Aga whose telephone number is (571) 270-1868. The

examiner can normally be reached on M-Th 7:30-5:00, F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Charles Garber can be reached on (571) 270-1868. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

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like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

S.A.

CHARLES D. GARBER
SUPERVISORY PATENT EXAMINER